

REMARKS

FIGURES 1-16 have been corrected, the specification has been amended, the abstract of the disclosure has been amended, and claims 1, 3, 4, 12, 13, and 16 have been amended.

Applicants respectfully request further examination and reconsideration of claims 1-17, still pending in the application.

The first Office Action mailed from the Patent Office on February 27, 2004 has been carefully considered and indicates that:

- a) The abstract of the disclosure is objected to;
- b) The disclosure is objected to;
- c) The drawings are objected to;
- d) Claim 4 is objected to;
- e) Claims 1, 3, 4, 12, 13, and 16 are rejected under 35 U.S.C. § 112, *first paragraph*, as failing to comply with the written description requirement;
- f) Claims 12-17 are rejected under 35 U.S.C. § 102(b) as being anticipated by Harris *et al.* '950;
- g) Claims 6, 10, and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over M. E. Frerking in view of Harris *et al.*;
- h) Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over M. E. Frerking in view of Harris *et al.* and further in view of Harris *et al.* '950 and Sutterlin *et al.* '209;

- i) Claim 8 is rejected under 35 U.S.C. § 103(a) as being unpatentable over M. E. Frerking in view of Harris et al. and further in view of Harris et al. '950, Sutterlin et al. '209, and Velez et al.;
- j) Claim 9 is rejected under 35 U.S.C. § 103(a) as being unpatentable over M. E. Frerking in view of Harris et al. and further in view of Harris et al. '950 and Sutterlin et al. '209, and Hein et al.; and
- k) Claims 2 and 5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants appreciate the Examiner's indication of the allowable subject matter of claims 2 and 5, and the apparent allowable subject matter of claim 1 since no art rejection was applied thereto, only a rejection on a formal issue.

In response to the Examiner's objection to the abstract of the disclosure, applicants have amended the specification by canceling the previous abstract and replacing it with a new abstract of the disclosure as required by the Examiner.

In view of the amendment made *supra* to the specification to replace the previous abstract with a new abstract of the disclosure, applicants respectfully submit that the Examiner's grounds for the objection to the abstract of the disclosure are no longer applicable and applicants therefore respectfully request that the Examiner withdraw this objection.

In response to the Examiner's objection to the disclosure, applicants have amended the specification by deleting page 35, line 12 to page 36, line 20 as required by the Examiner.

In view of the amendment made *supra* to the specification to delete page 35, line 12 to page 36, line 20, applicants respectfully submit that the Examiner's grounds for the objection to the disclosure are no longer applicable and applicants therefore respectfully request that the Examiner withdraw this objection.

In response to the Examiner's objection to the drawings, applicants:

1. Have amended FIGURES 1-16 to be designated by the legend "Prior Art."
2. Respectfully submit that applicants have used element letters in place of numbers to designate elements in the figures as permitted by 37 CFR § 1.74 "Reference to drawings" where it is ruled in pertinent part that reference letters or numbers can be used to designate elements in the figures ("...the detailed description of the invention shall refer to the... different parts by use of reference letters or numerals....").

In view of the amendments made *supra* to FIGURES 1-16 to be designated by the legend "Prior Art" and the explanation of 37 CFR § 1.74 presented *supra*, applicants respectfully submit that the Examiner's grounds for the objection to the drawings are no longer applicable and applicants therefore respectfully request that the Examiner withdraw this objection.

In response to the Examiner's objection to claim 4, applicants have amended claim 4 to change "a first adder input" to --a first input-- and "a second adder input" to --a second input-- as required by the Examiner. Such amendment merely

addresses an informality, and therefore does not relate to the prior art.

In view of the amendment made *supra* to claim 4 to change "a first adder input" to --a first input-- and "a second adder input" to --a second input--, applicants respectfully submit that the Examiner's grounds for the objection to claim 4 are no longer applicable and applicants therefore respectfully request that the Examiner withdraw this objection.

In response to the Examiner's rejection of claims 1, 3, 4, 12, 13, and 16 under 35 U.S.C. § 112, *first paragraph*, as failing to comply with the written description requirement, applicants have:

1. Amended claim 1 to change "connected to the feedback-path input terminal" to --indirectly connected to the feedback-path input terminal--.
2. Amended claim 3 to change "connected to the feedback-path input terminal" to --indirectly connected to the feedback-path input terminal--.
3. Amended claim 4 to change "connected to the feedback-path input terminal" to --indirectly connected to the feedback-path input terminal--.
4. Amended claim 12 to change "connected to the data input terminal" to --indirectly connected to the data input terminal--.
5. Amended claim 13 to change "connected to the first-mentioned all-pass network output terminal" to --indirectly connected to the first-mentioned all-pass network output terminal--.
6. Amended claim 16 to change "second adder" to --second subtractor--.

These amendments merely make explicit what was implicit in the claims as originally presented, and as such, do not relate

to the prior art. In view of the amendments made *supra* to claims 1, 3, 4, 12, 13 and 16 noted in items 1-6 above, applicants respectfully submit that the Examiner's grounds for the rejection of claims 1, 3, 4, 12, 13, and 16 under 35 U.S.C. § 112, *first paragraph*, as failing to comply with the written description requirement are no longer applicable and applicants therefore respectfully request that the Examiner withdraw this rejection.

In response to the Examiner's rejection of claims 12-17 under 35 U.S.C. § 102(b) as being anticipated by Harris *et al.* '950 and the Examiner's rejection of claims 6, 10, and 11 under 35 U.S.C. § 103(a) as being unpatentable over M. E. Frerking in view of Harris *et al.*, applicants have amended claims 12 and 16. Explanation of support for the amendments made to claims 12 and 16 can be found at the end of the instant amendment.

Claims 12 and 16 each disclose at least the following advantageous distinctive feature that distinguishes over and avoids the prior art:

"the sigma delta loop is used in a control loop application"

Claim 6 discloses at least the following advantageous distinctive features that distinguish over and avoid the prior art:

- a) "a processing chip configured to include a data input port, a data output port, and a sigma-delta modulator connected to the data input port and having a control-signal output port;" and
- b) "a feedback path connected between the control-signal output port and the data input port".

Claim 6 sets the stage for the signal flow of a feedback control system shown in FIGURE 28 of the application. The

signal enters the receiver signal condition chain containing an AGC element, a multiplier element, and a sampling element each controlled by the voltage residing at the output of analog low pass filters. The input to these low pass filters is the output of a set of sigma-delta modulators that have source coded the control signals formed in the digital receiver control loops.

The advantages of the advantageous distinctive feature of each of claims 12 and 16 discussed *supra* and advantageous distinctive features a) and b) of claim 6 discussed *supra* are presented *infra* to show the criticality of the advantageous distinctive feature of each of claims 12 and 16 and advantageous distinctive features a) and b) of claim 6 so as to show that the advantageous distinctive feature of each of claims 12 and 16 and advantageous distinctive features a) and b) of claim 6 are not merely a matter of design choice.

1. The sigma-delta modulator requantizes control signals in a digital receiver prior to passing them out of the processing chip. The sigma-delta modulator preserves the required dynamic range over the signal's restricted bandwidth with a one-bit output. The transfer of a single bit to control the analog components is a significantly less difficult task than the original. There is no longer a requirement for registers to accept the transfer, the busses to deliver the bits, or the DAC to convert the digital data to the analog levels the data represents. With minimal additional hardware, a device can generate analog control signals to control low-bandwidth analog functions in a system.
2. Using the sigma-delta modulator to deliver the control signals to the controlled elements affords a reduced complexity of the transfer, a reduced number of data lines

to deliver the signals, and a reduced number of bits in the d-to-a converters.

3. Using the sigma-delta modulator allows for hardware efficient implementation of control circuits with minimal hardware, e.g., using sigma-delta modulators for supplying low-bandwidth control information to analog gain control (AGC) and analog mixers for carrier frequency offset correction in communication systems.
4. Using the sigma-delta modulator allows realization of DC cancellers and hardware efficient control of external that only require low-bandwidth control signals, e.g., automatic gain control and frequency offset compensation in a communication receiver.

In contradistinction, contrary to the Examiner statement made in ¶ 10 of the office action, Harris *et al.* do not teach at page 107, col. 1, lines 15-53, figures 1 and 2, page 108, col. 1, lines 1-12, 25, and 26, and page 111, col. 1, lines 22-35 and 47-63 thereof "a processing chip configured to include a data input port, a data output port, and a sigma-delta modulator connected to the data input port and having a control-signal output port" and "a feedback path connected between the control-signal output port and the data input port" as required by advantageous distinctive features a) and b) of claim 6 discussed *supra*, respectively, but rather teach a technique based on a sigma-delta modulator for realizing a digital filter structure, as opposed to using sigma-delta techniques embedded in hybrid digital/analog loops.

FIGURE 1 of Harris *et al.* teaches a generic block diagram representing signal flow from an external signal that is sampled by an A-to-D converter, is source coded by a sigma-delta modulator to permit a description of the input samples with a reduced number of bits per sample, and a digital filter

that operates on the coded samples. The intent here is to reduce the workload required to implement the digital filter.

FIGURE 2 of Harris *et al.* teaches a block diagram of a noise feedback loop as an implementation of a sigma-delta modulator using an M-tap FIR filter as a noise prediction filter.

Regarding the Examiner's statement made at page 9, lines 8-12 of the office action that "...it would have been obvious to one having ordinary skill in the art at the time the invention [to implement] the FPGA chip as a digital receiver as described by Harris into the communications receiver as described in Frerking to perform the signal processing functions on the signal received," there is no motivating suggestion either in the references themselves or in the knowledge of one skilled in the art provided by the Examiner to modify the communications receiver of Frerking to implement the FPGA chip as a digital receiver of Harris as suggested by the Examiner. The Examiner has merely combined elements in a piecemeal manner in light of applicants' disclosure to show obviousness by using applicants' own disclosure as though it were prior art, and in so doing, has violated the basic mandate of 35 U.S.C. § 103 that a piecemeal reconstruction of the prior art in light of applicants' disclosure shall not be the basis for a holding of obviousness. *In re Kamm and Young*, 172 USPQ 298 at 301 ("the rejection here runs afoul of a basic mandate inherent in section 103 - that a 'piecemeal reconstruction of the prior art patents in the light of appellants' disclosure' shall not be the basis for a holding of obviousness. *In re Rothermel*, 47 CCPA 866, 870, 276 F.2d 393, 396, 125 USPQ 328, 331, (1960).").

Hence, neither Harris *et al.* '950, M. E. Frerking, nor Harris *et al.* discloses nor teaches the advantageous distinctive feature of each of claims 12 and 16 and



advantageous distinctive features a) and b) of claim 6, and for at least this reason alone, claims 6, 12, and 16 are allowable.

Regarding claims 10 and 11, since claims 10 and 11 ultimately depend from claim 6, claims 10 and 11 should be allowed for at least the same reasons claim 6 is allowed.

Regarding claims 13-15, since claims 13-15 ultimately depend from claim 12, claims 13-15 should be allowed for at least the same reasons claim 12 is allowed.

Regarding claim 17, since claim 17 depends from claim 16, claim 17 should be allowed for at least the same reasons claim 16 is allowed.

In view of the amendments made *supra* to claim 12 and 16 and the arguments presented *supra*, applicants respectfully submit that the Examiner's grounds for the rejection of claims 12-17 under 35 U.S.C. § 102(b) as being anticipated by Harris *et al.* '950 and the Examiner's grounds for the rejection of claims 6, 10, and 11 under 35 U.S.C. § 103(a) as being unpatentable over M. E. Frerking in view of Harris *et al.* are no longer applicable and applicants therefore respectfully request that the Examiner withdraw these rejections.

In response to the Examiner's rejection of claim 7 under 35 U.S.C. § 103(a) as being unpatentable over M. E. Frerking in view of Harris *et al.* and further in view of Harris *et al.* '950 and Sutterlin *et al.* '209, applicants respectfully submit that since claim 7 depends from claim 6, claim 7 should be allowed for at least the same reasons claim 6 is allowed.

In view of the argument presented *supra*, applicants respectfully submit that the Examiner's grounds for the rejection of claim 7 under 35 U.S.C. § 103(a) as being unpatentable over M. E. Frerking in view of Harris *et al.* and further in view of Harris *et al.* '950 and Sutterlin *et al.* '209

are no longer applicable and applicants therefore respectfully request that the Examiner withdraw this rejection.

In response to the Examiner's rejection of claim 8 under 35 U.S.C. § 103(a) as being unpatentable over M. E. Frerking in view of Harris *et al.* and further in view of Harris *et al.* '950, Sutterlin *et al.* 209, and Velez *et al.*, applicants respectfully submit that since claim 8 ultimately depends from claim 6, claim 8 should be allowed for at least the same reasons claim 6 is allowed.

In view of the argument presented *supra*, applicants respectfully submit that the Examiner's grounds for the rejection of claim 8 under 35 U.S.C. § 103(a) as being unpatentable over M. E. Frerking in view of Harris *et al.* and further in view of Harris *et al.* '950, Sutterlin *et al.* 209, and Velez *et al.* are no longer applicable and applicants therefore respectfully request that the Examiner withdraw this rejection.

In response to the Examiner's rejection of claim 9 under 35 U.S.C. § 103(a) as being unpatentable over M. E. Frerking in view of Harris *et al.* and further in view of Harris *et al.* '950 and Sutterlin *et al.* '209, and Hein *et al.*, applicants respectfully submit that since claim 9 ultimately depends from claim 6, claim 9 should be allowed for at least the same reasons claim 6 is allowed.

In view of the argument presented *supra*, applicants respectfully submit that the Examiner's grounds for the rejection of claim 9 under 35 U.S.C. § 103(a) as being unpatentable over M. E. Frerking in view of Harris *et al.* and further in view of Harris *et al.* '950 and Sutterlin *et al.* '209, and Hein *et al.* are no longer applicable and applicants therefore respectfully request that the Examiner withdraw this rejection.

Explanation of support for the amendments made to claims 12 and 16 can be found in the specification, for example at page 31, line 15 to page 33, line 29 and FIGURES 27 and 28 which form a part of the original disclosure and therefore can be relied upon for support. *Corometrics Medical Systems, Inc. v. Berkeley Bio-Engineering, Inc.*, 193 USPQ 467 at 473, 476 (D.C. N.D. California 1977) ("[M]aterial added [that] is clearly disclosed by the original drawings...is not new matter." and "An amendment does not constitute new matter where the amendment...includes matter clearly disclosed by drawings in the original application."). Therefore, the amendments made to claims 12 and 16 do not constitute new matter.

#### CONCLUSION

All claims should be now be in condition for allowance and a Notice of Allowance is respectfully requested.

If there are any questions, the applicants' attorney can be reached at Tel: 408-879-4641 (Pacific Standard Time).

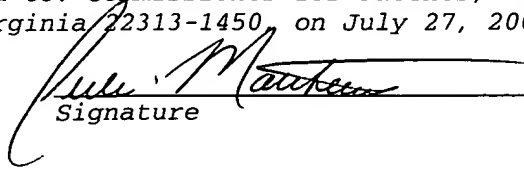
Respectfully submitted,



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*I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on July 27, 2004.*

Julie Matthews  
Name

  
Signature